

Study on the physiological index of drought tolerance for napiergrass ⁽¹⁾

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Abstract

In this study, Napiergrass Taishiu cv. No. 3, 6, 7, 8 (NP cv. TS 3, 6, 7, 8) were cultivated in the pot with different water condition under shading-nets to determine the agronomic traits and physiological values. In the trial, the control treatment was irrigated twice a week, and the drought treatment groups were irrigated once every two weeks, in simulation of the drought adversaries during the growth period of grass. The results showed that the fresh biomass yields of all napiergrass varieties were significantly lower in the drought groups than those in the control group. The SPAD (Soil-Plant Analysis Development) values of NP cv. TS 3, 6, and 8 were significantly lower in the drought groups. In terms of electrolyte leakage rate, the drought groups of all napiergrass varieties were significantly higher than the control group. There were no significant differences between control groups and drought groups in the water-soluble carbohydrate contents and the starch contents of all the varieties. With regards to the inorganic ions, the content of Ca^{2+} in the drought group of NP cv. TS 3 was significantly higher than that in the control group. Correlation analyses showed that the correlation coefficients between fresh yield and SPAD value, and between fresh yield and electrolyte leakage rate were the highest, which correlation coefficient was greater than 0.7 and highly correlated. Hence, findings suggest that SPAD value and electrolyte leakage rate might be used as the physiological index for evaluating the drought tolerance of napiergrass.

Key words: Napiergrass, Drought tolerance, Physiological index, Forage crops.

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